

Law Offices
ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP
Suite 1000
1725 K Street
Washington, D.C. 20006

(202) 659-2930
Facsimile (202) 887-0357; Facsimile (202) 331-7519

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DATE: December 3, 2003

TO: Examiner J. M. Villecco
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RE: **Second Office Action (Final)**
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U.S. Patent Application S.N. 09/361,610
By: KOBAYASHI, et al.
Our Reference: 990864

FROM: William L. Brooks

FAC. NO.: 703-746-7052 (phone: 703-305-1460)

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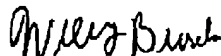
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Dear Examiner Villecco:

As we discussed on the telephone today, attached hereto are the proposed claim amendments to be discussed during the telephone interview. Please call me after you review these proposed claim amendments to set up a time for the interview.

Very truly yours,



William L. Brooks

WLB/mla

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PROPOSED CLAIM AMENDMENTS

U.S. SERIAL NO. 09/361,610

Amend claims 18-20, 22, 24-26 and 28 as follows:

Claim 18 (currently amended): A digital camera, comprising:

an imager including a vertical transfer register having a plurality of transfer areas, a horizontal transfer register connected to an output terminal of said vertical transfer register, and a plurality of light-receiving elements respectively assigned to said plurality of transfer areas;

a timing generator connected to said imager, and for applying timing signals to said imager, wherein said timing signals ~~including~~ include a first exposure signal for carrying out a first exposure of a first time period, a second exposure signal for carrying out after said first exposure a second exposure of a second time period, which is shorter than said first time period, a first reading signal for reading-out from ~~[[the]]~~ first light-receiving elements intermittently present in a vertical direction out of said plurality of light-receiving elements to said vertical transfer register ~~[[a]]~~ first electric ~~charge~~ charges generated by said first exposure, a second reading signal for reading-out from ~~[[the]]~~ second light-receiving elements respectively assigned to vacant transfer areas in which no electric charge is present out of said plurality of light-receiving elements to said vertical transfer register ~~[[a]]~~ second electric ~~charge~~ charges generated by said second exposure, a vertical transfer signal for transferring the electric ~~charge~~ charges read-out to said vertical transfer register in a vertical direction, and a horizontal transfer signal for transferring in a horizontal direction the electric ~~charge~~ charges that reaches said horizontal

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transfer register by a transfer in accordance with said vertical transfer signal, and wherein said second light receiving elements are intermittently present in the vertical direction, and said first electric charges read out by said first reading signal and said second electric charges read out by said second reading signal are alternately arranged on said vertical transfer register; and

a processor for generating one screen of a first image signal based on said first electric charge charges and said second electric charge charges output from said imager.

Claim 19 (currently amended): A digital camera according to claim 18, wherein [[the]] said second light-receiving element ~~elements~~ from which said second electric charge is read-out is are equal to [[the]] said first light-receiving element ~~elements~~ from which said first electric charge is read-out, and said second electric charge charges [[is]] are read-out to said vertical transfer register at the same time that a vertical transfer of said first electric charge charges [[is]] are started or after the vertical transfer of said first electric charge charges [[is]] are started.

Claim 20 (currently amended): A digital camera according to claim 19, wherein [[the]] said first light-receiving element ~~elements~~ from which said first electric charge is read-out are intermittently present present in a vertical direction using successive N ($N \geq 1$) of elements as one unit, and said first electric charge moves charges move over a distance corresponding to at least N of the light-receiving elements until said second electric charge is charges are read-out.

Claim 22 (currently amended): A digital camera according to claim 18, further

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comprising:

an instruction key for inputting an imaging instruction; and

a shutter member arranged at a front surface of said imager, and for cutting-off an irradiation of light into said imager; wherein said timing signal further includes a third exposure signal output in response to an operation of said instruction key, and for carrying out a third exposure of a third time period, a third reading signal for reading out from said plurality of light-receiving elements to said vertical transfer register ~~[[a]]~~ third electric charge charges generated by said third exposure, a second vertical transfer signal for transferring in a vertical direction said third electric charge charges on said vertical transfer register, a second horizontal transfer signal for transferring in a horizontal direction said third electric ~~charge~~ charges applied to said horizontal transfer register, a fourth exposure signal for carrying out a fourth exposure after said third exposure, a driving signal output after a fourth time period, which is different from said third time period, has passed since a time of starting said fourth exposure, and for driving said shutter member, a fourth reading signal for reading out ~~[[a]]~~ fourth electric charge charges generated by said fourth exposure from said plurality of light-receiving elements to said vertical transfer register after a completion of a vertical transfer of said third electric ~~charge~~ charges, a third vertical transfer signal for transferring in a vertical direction said fourth electric charge charges on said vertical transfer register, and a third horizontal transfer signal for transferring in a horizontal direction said fourth electric ~~charge~~ charges applied to said horizontal transfer register, and said processor generating one screen of a second image signal based on said third electric ~~charge~~ charges and fourth electric ~~charge~~ charges output from said imager.

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Claim 24 (currently amended): A digital camera, comprising:

an imager including a vertical transfer register having a plurality of transfer areas, a horizontal transfer register connected to an output terminal of said vertical transfer register, and a plurality of light-receiving elements respectively assigned to said plurality of transfer areas;

an exposure controller for controlling an exposure of said imager by using an electric shutter system;

a reader for reading out from a portion of said plurality of light-receiving elements to said vertical transfer register ~~[[an]]~~ electric ~~charge~~ charges generated by an exposure of said exposure controller;

a vertical transferor for transferring in a vertical direction the electric ~~charge~~ charges read-out to said vertical transfer register by said reader;

a horizontal transferor for transferring in a horizontal direction the electric ~~charge~~ charges that reaches said horizontal transfer register by a transfer of said vertical transferor, wherein said exposure controller carries out a first exposure of a first time period, and carries out after said first exposure a second exposure of a second time period, which is shorter than said first time period, said reader reading reads out from ~~[[the]]~~ first light-receiving elements intermittently present in a vertical direction out of said plurality of light-receiving elements to said vertical transfer register ~~[[a]]~~ first electric ~~charge~~ charges generated by said first exposure, reading and reads out from ~~[[the]]~~ second light-receiving elements respectively assigned to vacant transfer areas in which no electric charge is present out of said plurality of light-receiving elements to said vertical transfer register ~~[[a]]~~ second electric ~~charge~~ charges generated by said second

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exposure, and wherein said second light receiving elements are intermittently present in the vertical direction, and said first electric charges and said second electric charges read out by said reader are alternately arranged on said vertical transfer register; and

~~said digital camera further comprising a generator for generating one screen of a first image signal based on said first electric charge charges and said second electric charge charges~~
output from said imager.

Claim 25 (currently amended): A digital camera according to claim 24, wherein ~~[[the]]~~
~~said second light-receiving element elements from which said second electric charge is read-out~~
~~is are~~ equal to ~~[[the]]~~ ~~said first light-receiving element elements from which said first electric~~
~~charge is read-out~~, said reader reads out said second electric charge charges to said vertical
transfer register at the same time that a vertical transfer of said first electric charge is ~~charges are~~
started or after the vertical transfer of said first electric charge is ~~charges are~~ started.

Claim 26 (currently amended): A digital camera according to claim 25, wherein ~~[[the]]~~
~~said first light-receiving element elements from which said first electric charge is are~~ read-out
intermittently ~~presents present~~ in a vertical direction using successive N ($N \geq 1$) of elements as
one unit, and said vertical transferor moves said first electric charge charges over a distance
corresponding to at least N of the light-receiving elements until said second electric charge is
~~charges are~~ read-out.

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Claim 28 (currently amended): A digital camera according to claim 24, further comprising: an instruction key for inputting an imaging instruction;

a shutter member arranged at a front surface of said imager, and for cutting-off an irradiation of light into said imager; and

a driver for driving said shutter member, wherein said exposure controller carries out a third exposure of a third time period in response to an operation of said instruction key, and starts a fourth exposure after said third exposure, said reader reads out from said plurality of light-receiving elements to said vertical transfer register [[a]] third electric ~~charge~~ charges generated by said third exposure, and reads out [[a]] fourth electric ~~charge~~ charges generated by said fourth exposure from said plurality of light-receiving elements to said vertical transfer register after a completion of a vertical transfer of said third electric ~~charge~~ charges, said driver drives said shutter member when a fourth time period, which is different from said third period, has passed since a time of starting said fourth exposure, and said generator generates one screen of a second image signal based on said third electric ~~charge~~ charges and said fourth electric ~~charge~~ charges output from said imager.

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